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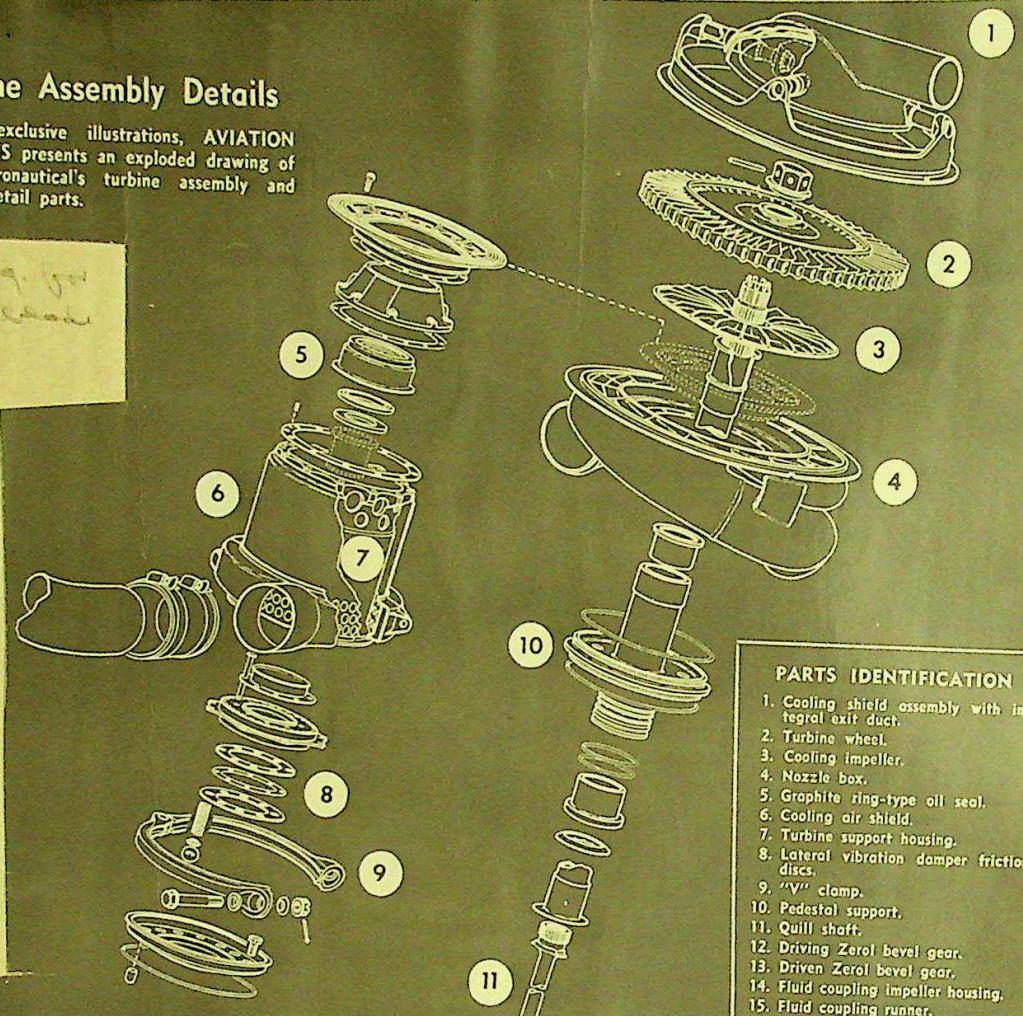
Turbine Assembly Details

In these exclusive illustrations, AVIATION OPERATIONS presents an exploded drawing of Wright Aeronautical's turbine assembly and photos of detail parts.

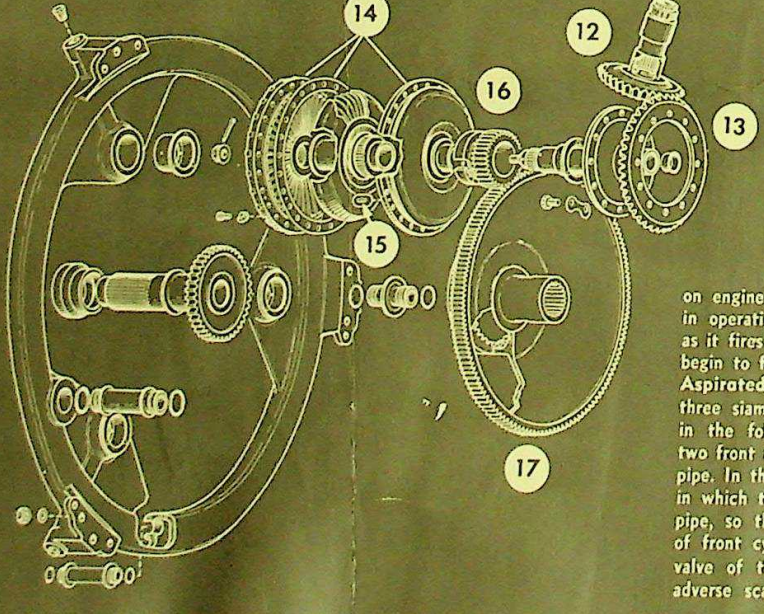
See second pg. for divided sketch



PARTS IDENTIFICATION

1. Cooling shield assembly with integral exit duct.
2. Turbine wheel.
3. Cooling impeller.
4. Nozzle box.
5. Graphite ring-type oil seal.
6. Cooling air shield.
7. Turbine support housing.
8. Lateral vibration damper friction discs.
9. "V" clamp.
10. Pedestal support.
11. Quill shaft.
12. Driving Zerol bevel gear.
13. Driven Zerol bevel gear.
14. Fluid coupling impeller housing.
15. Fluid coupling runner.
16. Pinion gear.
17. Crankshaft drive gear.

Nozzle box (top view). Guide vanes split for thermal expansion

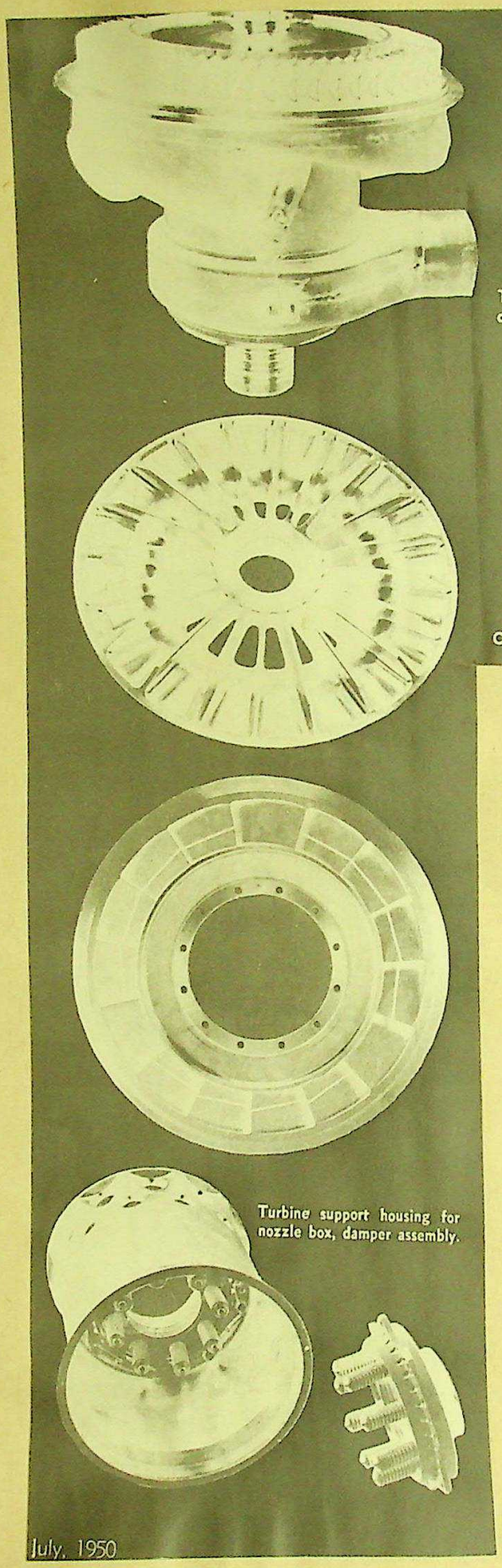


Design Highlights

Vibration Damper: To meet the problem of lateral vibration of the turbine shaft during operation, Wright Aero engineers utilized a series of bronze and steel friction discs (see 8 in drawing) which are attached to the turbine support housing. They are spring-loaded and serve to dampen lateral vibration of the shaft. The outboard bearing, which supports the shaft, is in turn attached to the discs.

Fluid Coupling: In order to avoid unnecessary load on the starter in firing up the engine, the fluid coupling (see 14 in drawing) was designed to run on engine oil, present in the coupling only when the engine is in operation. The basic engine, therefore, is started first, and as it fires oil is pumped to the coupling as the turbine blowers begin to function.

Aspirated Exhaust Piping: Each turbine is fed by a set of three siamesed exhaust pipes. The pipes are siamesed together in the following combinations: Two rear row cylinder pipes, two front row cylinder pipes, and one front and one rear cylinder pipe. In this latter combination the aspirator principle is utilized in which the front cylinder pipe projects into the rear cylinder pipe, so that as the rear pipe exhausts it aids in scavenging of front cylinder. This arrangement was necessary because the valve of the front row cylinder overlapped the rear, causing adverse scavenging.



Turbine nozzle box and cooling shield assembly.

Cooling impeller.

Turbine support housing for nozzle box, damper assembly.

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